

## LOCKING CAP ASSEMBLY FOR SPINAL FIXATION INSTRUMENTATION

### CROSS REFERENCE TO RELATED APPLICATION

6, 755,829 This application is a continuation of United States patent application serial number  
5 ~~09/667,937~~ to Bono et al., filed on September 22, 2000, and entitled "Lock Cap Anchor  
Assembly for Orthopaedic Fixation," which application is incorporated herein by reference in its  
entirety.

### BACKGROUND OF THE INVENTION

10 The present invention relates to orthopedic fastening systems and to mechanisms for  
securing and locking a linking or stabilizing element, such as a rod, to a bone screw having a  
slotted head that receives the rod therein. It also relates to structures or anchor assemblies  
having such a slotted or open head for receiving a rod, wherein the slotted portion extends from a  
hook, plate, bracket or positioning arm.

15 A number of such structures are known. Thus, for example, the widely used Harms T-  
plate used for stabilizing the cervical vertebrae has a projecting slotted bolt adapted to receive a  
rod or cable through the slot and clamp down by screwing a nut along the bolt to bear down  
against the rod. Several patents show holding structures for a fixation rod that are incorporated  
in the head of a screw, as in U.S. Patent 5,672,176, or into a small offset plate which itself may  
20 be fastened to the bone, as shown in published International Application WO96/28105. Other  
systems involve hooks, transverse rod connectors, or tandem connectors. Various tools have  
been provided for these systems to enable the surgeon to bend and shape the rod to a desired  
contour in situ, to position the rod in the slot of a bolt or head, and to secure the rod in position.

25 Because the rod is the stabilizing member which provides a precise contour, spacing or  
connection between one or more vertebrae, bones or bone fragments, alignment is quite critical,  
and the ability to pass the rod through two or more connecting assemblies requires various  
actions to form and shape the rod, or align the receiving structures at defined positions or path  
before final clamping is effected. This may involve positioning and removing the rod several  
times to check and adjust the degree of alignment. Thus, it is generally desirable to have a  
30 closure or secure locking mechanism that may be effected with simple installation steps.